



Washington Aqueduct 2004 Annual Water Quality Report June 2005

MESSAGE FROM THE GENERAL MANAGER

I am pleased to present Washington Aqueduct's performance for 2004. You can read what Washington Aqueduct is doing to change the way it disposes of the sediment that is removed during the water treatment process. This is an important improvement being made in conjunction with a new permit issued by the Environmental Protection Agency.

During 2004, you undoubtedly heard a lot about lead in the drinking water. We're pleased to report that new treatment is working well to reduce the corrosiveness of the water that was leading to an elevated concentration of lead in some homes served by lead service lines in the District of Columbia.

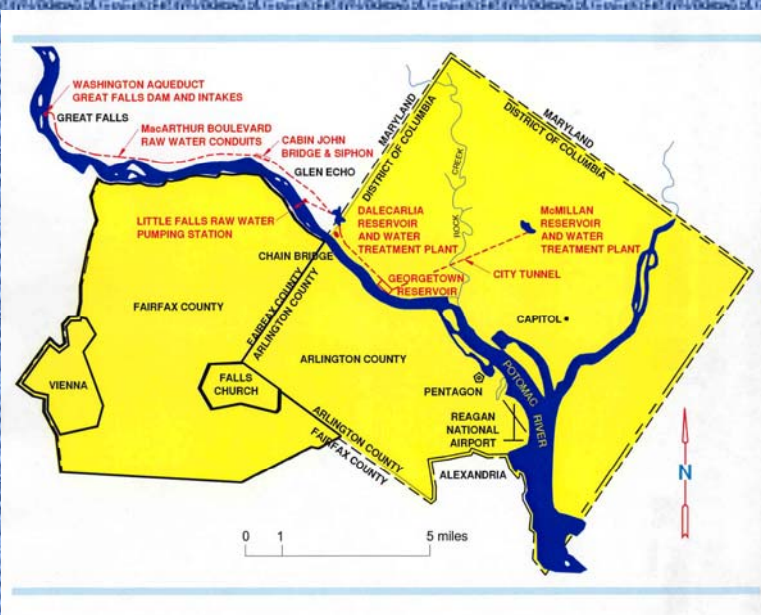
Looking to the future, Washington Aqueduct has joined with other utilities in this region to emphasize the importance of source water protection.

Thomas P. Jacobus
General Manager



Source Water Protection

The Potomac River, which is the source water for Washington Aqueduct and other water suppliers in the region, is subject to contamination by upstream activities. To address source water quality concerns, the Washington Aqueduct and the other local water utilities joined with government agencies to create the Potomac River Basin Source Water Protection Partnership in September 2004. The partnership also includes state agencies from Maryland, Virginia, Pennsylvania, and the U.S. Environmental Protection Agency. This partnership will provide a drinking water perspective to enhance the effectiveness of existing and future watershed protection efforts.



Corrosion Control

Lead is not present in the finished water produced by the Washington Aqueduct water treatment plants. If water is too corrosive sits in constant with plumbing elements containing lead, the lead can leach and enter the water. Even if a house does not have a lead service line and it does not have lead solder, fixtures and valves made of bronze or brass may contain a small percentage of lead.

In response to findings of lead in samples collected from some homes in the District of Columbia distribution system served by lead service lines, the Washington Aqueduct formed a technical expert working group comprised of knowledgeable representatives from each of the customers, the Centers for Disease Control, the U.S. EPA, the D.C. Department of Health, and the Virginia Department of Health. This group has worked together to optimize water treatment and minimize corrosion by reviewing relevant aspects of the treatment process and the distribution systems. In August 2004, after a thorough review current activities, research, and a test phase, a corrosion inhibitor, orthophosphate, was added to the treatment process. Orthophosphate works by forming a protective coating inside pipes that decreases the amount of lead that leaches from a lead service line and home plumbing systems.

Optimized corrosion control provides the strongest barrier to lead exposure short of removing the lead pipes. Initial test results from the first six months of orthophosphate application show an overall decline in the lead concentrations in homes connected by lead service lines. We are currently performing research using pipe loop studies to determine the optimal treatment to mitigate lead corrosion and protect the public health. The knowledge gained from this study may help other water utilities optimize corrosion control.

Capital Improvements

Washington Aqueduct's capital improvement program is designed to sustain the infrastructure and provide for new processes to upgrade water quality and to meet new regulatory requirements. Recently completed important projects include structural improvements to the Georgetown Reservoir; rehabilitation of the old pumping station to create space for a future Visitors Center; flood control improvements to the Dalecarlia Reservoir; rehabilitation of the McMillan East Shaft Pumping Station; improvements to the West Filter Building instrumentation at Dalecarlia.

Current projects include improvements to the pumps, valves and motors in the Dalecarlia Pumping Station; Supervisory Control and Data Acquisition (SCADA) improvements; corrosion control optimization; renovation of the water quality laboratory; renovation of the electrical systems in the Little Falls Pumping Station; and environmental impact studies for the design of the residuals disposal facilities.

Residual Disposals Update

The U.S. EPA issued a revised National Pollutant Discharge Elimination System permit in March 2003. This permit set new discharge limits for the periodic discharge of sediment and coagulant to the Potomac River. It prohibits discharges from February 15 through June 30 while fish are spawning and hatching. A Federal Facilities Compliance Agreement provides a timetable to comply with the new effluent limits and it accompanies the permit. A Draft Environmental Impact Statement (DEIS) for a project to recover and dispose of these solids was issued in April 2005. The public comment period ends on July 6, 2005.

Washington Aqueduct will evaluate comments and incorporate them into the Final Environmental Impact Statement. The Baltimore District Engineer will make the implementation decision and execute a Record of Decision. After this selection is accepted by the U.S. EPA Region 3, design and construction will begin. The deadline for at least one of the six sedimentation basins to be in compliance with the permit effluent standards is March 2008, and all basins must be in compliance by December 31, 2009. As part of our design process, we must involve the National Capital Planning Commission and the Commission on Fine Arts as well as other agencies.

Washington Aqueduct looks forward to working with the agencies' and the public's input to improve the quality of the Potomac River while maintaining our ability to produce sufficient quantities of treated water.

Water Quality Table for 2004						
Regulated Parameters	Units	EPA MCLG	EPA MCL	Washington Aqueduct System		Major Source in Drinking Water
				Highest	Range	
Turbidity	NTU	NA	TT	.12 (Highest single measurement)	.04 -.12	Soil runoff
Radioactive Contaminants (2002 Data)						
Alpha emitters	pCi/L	0	15	1.3	ND - 1.3	Erosion of natural deposits.
Beta/Photon emitters	pCi/L	0	50*	3.0	1.2 - 3.0	Decay of natural and man-made deposits.
Inorganic Contaminants						
Arsenic	ppb	NA	50*	0.5	ND - 0.5	Erosion of natural deposits.
Barium	ppm	2	2	0.05	.03 - .05	Erosion of natural deposits.
Chromium	ppb	100	100	1.3	ND - 1.3	Erosion of natural deposits.
Copper (WTP samples)	ppm	1.3	1.3	.018	.001-.018	Erosion of natural deposits.
Fluoride	ppm	4	4	0.96	.71 - 0.96	Water additive that promotes strong teeth.
Nitrate	ppm	10	10	2.63	1.36 - 2.63	Erosion of natural deposits.
Selenium	ppb	50	50	1.0	ND - 1.0	Erosion of natural deposits.
Organic Contaminants						
Atrazine	ppb	3	3	0.18	ND - 0.18	Herbicide runoff
Chloramines	ppm	4	4	3.8	3.3 - 3.8	Disinfectant to treat the water.
		MRDLG	MRDL			
Di(2-Ethylhexyl) Adipate	ppb	400	400	0.68	ND - 0.68	Discharge from chemical factories.
Haloacetic Acids (5)	ppb	NA	60	30.7	10.4 - 30.7	By-product of drinking water disinfection.
Simazine	ppb	400	400	.10	ND - .10	Herbicide runoff
Total Organic Carbon	ppm	NA	TT	1.58 97-2.05	1.75 1.45-2.11	Naturally present in the environment
Total Trihalomethanes	ppb	0	80	27.1 12.0-46.1	35.1 14.2-65.9	By-product of drinking water disinfection.
<p>*Effective January 23, 2006, Arsenic MCL changes to 10 ppb.</p> <p>*Beta particles detected below 50 pCi/L is reported as pCi/L rather than the actual MCL of 4 mrem/yr. EPA considers 50 pCi/L to be the level of concern.</p> <p>TOC removal is regulated based on the percentage how much is removed in the treatment process divided by the target removal percentage set by the EPA. Compliance is based on the average removal over the year. The detected level of 1.0 indicates Washington Aqueduct removes the required amount of TOC.</p>						

Explanation of Terms for the Water Quality Chart

ppm - parts per million or milligrams per liter.

ppb - parts per billion or micrograms per liter.

NTU - nephelometric turbidity units.

MCL - maximum contaminant level - the highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available technology.

MCLG - maximum contaminant level goal - the highest level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow a margin of safety.

TT - treatment technique - a required process intended to reduce the level of a contaminant in drinking water.

pCi/L- Picocuries per liter is a measure of radioactivity.

AL- Action Level. The concentration of a substance which, if exceeded triggers treatment or other requirements that a water system must follow.

MRDL- Maximum Residual Disinfectant Level. The highest level of a disinfectant that is allowed.

MRDLG- Maximum Residual Disinfectant Level Goal. The level of drinking water disinfectant in water below which there is no known or expected risk to health.

ND- Not detected.

mrem/year- millirems per year-- a measure of radiation absorbed by the body.

Turbidity is the cloudiness of water caused by suspended particles. Turbidity can interfere with disinfection and provide a medium for microbial growth.

Perchlorate Detected in Ground Water Near Dalecarlia Water Treatment Plant

In November 2004, while conducting sampling to detect any chemical compounds in the *ground water* that might be associated with the American University Experiment Station Formerly Used Defense Site (often referred to as "Spring Valley"), EPA Region 3 detected a small concentration of perchlorate in the range of 7 micrograms per liter.

The Washington Aqueduct water treatment plants use *surface water*, specifically the Potomac River as the exclusive source of raw water to send to the Dalecarlia and McMillan water treatment plants. To be sure that whatever the source of the perchlorate detected by the EPA sampling in the *ground water* was not affecting the water treatment operations, Washington Aqueduct began a program to sample the Dalecarlia Reservoir and the sedimentation basins at Dalecarlia as well as the finished water from both treatment plants.

In November 2004, low levels of perchlorate ranging from non-detect to 1.7 ppb were found in the Dalecarlia Reservoir and ranging from non-detect to 1.6 ppb in the Dalecarlia plant effluent. Perchlorate has not been detected in any finished water sample since November 2004. The source of the perchlorate is not known but may have been influenced by a perchlorate discharge upstream in the Potomac River. To determine what influence, if any, the ground water around the Dalecarlia Reservoir is having on the water in the reservoir, a series of sampling wells was installed in the spring of 2005. Starting in the summer of 2005, the wells will be routinely sampled to determine flow patterns as well as constituents of the ground water.

The GAO recently published their study of perchlorate in the United States and the reported health risks associated with perchlorate (www.gao.gov/new.items/d05462.pdf). The report noted, "EPA revised its reference dose to a level that is equivalent to 24.5 ppb in drinking water. The reference dose is not a drinking water standard; it is a scientific estimate of the total daily exposure level from all sources that is not expected to cause adverse effects in humans, including the most sensitive populations." The reference dose will be used in EPA's ongoing efforts to address perchlorate in drinking water.

Sources of Drinking Water Contamination

Microbial (such as viruses and bacteria) from human or animal sources.

Inorganic (such as salts and metals) from storm runoff, industrial or domestic wastewater discharges, oil, mining, and farming.

Pesticides and herbicides- from agriculture, stormwater runoff, and residential uses.

Organic chemicals (including synthetic and volatile organics) from byproducts of industrial processes and petroleum production, gas stations, urban stormwater runoff, and septic systems.

Radioactive- from oil and gas production, mining activities and from natural occurring

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground it dissolves naturally occurring minerals and in some cases radioactive material and can pick up substances resulting from the presence of animals or human activity. Contaminants may enter drinking water before, during, or after treatment. Washington Aqueduct treats their water, as necessary, to ensure that their customers receive water that is safe to drink.

EPA Information on Weakened Immune Systems

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune systems disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

Guidelines are provided by the Environmental Protection Agency and Centers for Disease Control on the appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants. These guidelines are available from the Safe Drinking Water Hotline **(800-426-4791)**.

Cryptosporidium

Washington Aqueduct constantly monitors the water supply for various contaminants. In 2004 no *Cryptosporidium* or *Giardia* was found in our source water. *Cryptosporidium* and *Giardia* are parasitic microbes found in surface water throughout the U.S. Although filtration removes them, most commonly used filtration methods cannot guarantee 100 percent removal. Current test methods cannot determine if the organisms are dead or if they are capable of causing disease. Ingestion of *cryptosporidium* may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy individuals can overcome the disease in a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. *Cryptosporidium* must be ingested to cause disease and it may be spread through means other than drinking water.

Contaminants

In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

We have learned through our monitoring and testing that some contaminants have been detected. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline **(800-426-4791)**.

Other Parameters of Concern

Endocrine Disruptors - Endocrine Disruptors or endocrine disrupting chemicals (EDCs) are a group of substances that can cause serious health problems in humans and or other animals. They are an emerging water quality issue because they can get into the source water from runoff, livestock operation or from medical discharges in the sanitary sewers. Endocrine disruptors are synthetic or naturally occurring chemicals that changes the balance of normal hormone functions in animals, including humans. Many different chemicals exhibit endocrine disrupting effects including pesticides, pharmaceuticals (like birth control pills), plasticizers, etc. While the EPA regulates some chemicals which are thought to be endocrine disruptors, the research on what chemicals may be endocrine disruptors is just beginning. There are currently few methods available to test samples for endocrine disruptors. Because research is still in its infancy, it may take a long time before a complete list of endocrine disruptor chemicals is available and can be monitored.

MTBE - MTBE, or methyl tertiary butyl ether, is a former gasoline additive that can contaminate drinking water supplies from leaking fuel storage tanks. Tests show that there is no MTBE in the water produced by Washington Aqueduct.

If you have further questions please contact Washington Aqueduct at:

<http://washingtonaqueduct.nab.usace.army.mil>

Contact your local water utility:

District of Columbia

DC Water and Sewer Authority
Department of Water Services
202-612-3434

<http://www.dcwasa.com/>

Arlington County

Department of Public Works
Water, Sewer and Streets
703-228-6578

<http://www.co.arlington.va.us/dpw/>

Falls Church

Department of Environmental Services
703-248-5070

<http://www.ci.falls-church.va.us>

